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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,413	09/13/2004	Masayuki Nate	121108	6891

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EXAMINER

EWALD, MARIA VERONICA

ART UNIT	PAPER NUMBER
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1722

DATE MAILED: 05/24/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/507,413

Applicant(s)

NATE ET AL.

Examiner

Maria Veronica D. Ewald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-10 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

13. The following are quotations of the first and second paragraphs of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 9 – 10 and 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to claims 9 – 10, Applicant has amended claim 9 to state "...wherein the die is made of a hard metal having high abrasion resistance." The specification discusses the advantages of using cemented carbide, but there is no discussion anywhere in the specification as to whether the cemented carbide can be adequately substituted with a hard metal. The only reference to a hard metal in the specification is in the background art. Applicant has pointed out throughout the specification the advantages of cemented carbide and only point to its wear resistance.

With respect to claim 12, claim 12 has been amended to state the die thickness range between 15 – 30 um (micrometers); however, this range is *not* identified

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anywhere in the specification. The specification discloses (as originally claimed) a die thickness range of 15 – 30 mm (millimeters), preferably, 24 mm (lines 10 – 15, page 6).

With respect to claim 12, claim 12 is also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 has been amended to state that the die thickness is 15 – 30 um (micrometers). However, this renders the claim indefinite, since this specified die thickness is a factor of a *thousand less than the radius of curvature of the die corners*, which is specified to be in the range of 500 – 1500 um. Because claim 12 has been amended as such, it is unclear as to whether Applicant is claiming such a thin die or if Applicant means that the cell wall thickness or slit width thickness of the die is to be within the range of 15 – 30 um.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 7 is rejected under 35 U.S.C. 102(b) as being anticipated by Yoshimasa, et al (JP 2000-071225). Yoshimasa, et al. teach a die for forming a honeycomb body, the die comprising a structure provided with: groovy slits formed on a front face thereof, the slits being formed by cell blocks (item 4 – figure 3); and back holes on a back face

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thereof, each hole being communicatively connected with the slit (item 2 – figures 1 and 3); wherein the number of the cell blocks per one side of the die is an even number, and the back holes are disposed at every other position of the cell blocks (figures 1 and 3).

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimasa, et al. in view of Suzuki (U.S. 6,193,497) and further in view of Ohno (U.S. 6,669,751). Yoshimasa, et al. teach the characteristics previously described but do not teach that the honeycomb body has curved portions formed at four corners of a peripheral portion of the die and wherein a radius of curvature of the curved portions is 0.5 – 1.5 mm.

In a method to form an extrusion die for a honeycomb structural body, Suzuki teaches a die comprised of a plurality of intersecting slits arranged on the front surface of a die, forming cell blocks and a plurality of raw material feeding holes arranged on the back surface of the die (column 3, lines 8 – 14). Furthermore, Suzuki teaches that it is possible to manufacture a honeycomb extrusion die, in which a round portion is formed at corners of a cell block so as to increase strength of a ceramic honeycomb structural body (column 2, lines 1 – 6). Suzuki also displays the results of several tests in which

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the radius of curvature of the round portion of the die is varied between 0 – 160 μm or 0 – 16 mm. From the tests performed, Suzuki concluded that the target properties of compression strength, isostatic strength, thermal shock resistance, and transformation amount were optimized when the radius of curvature was between 15 – 80 μm (figure 3; column 6, lines 43 – 48). Suzuki, however, does not indicate results at which the radius of curvature was tested between 0.5 and 1.5 mm.

Ohno, however, shows a method by which a honeycomb structural body is manufactured for use as filters, in which the corners of the outer surfaces of the honeycomb structure is curved to define round surfaces (column 12, lines 1 – 5). Having rounded corners allows the structure to withstand stresses and thereby avoid cracking or chipping (column 12, lines 10 – 15). Furthermore, Ohno, teaches that the optimum results are achieved when the radius of curvature is greater than 0.3 mm, but less than 2.5 mm. With a radius of curvature less than 0.3 mm, the corners are still angled and thus, do not sufficiently withstand stresses, but greater than 2.5 mm, the cross-sectional area of the structure decreases, and thus, the optimum range is 0.3 – 2.5 mm (column 12, lines 10 – 20).

Therefore, it would have been obvious at the time of the Applicant's invention to modify the die structure of Yoshimasa, et al. such that the four peripheral corners are rounded as taught by Suzuki and such that the radius of curvature of the four corners is between the range of 0.5 – 1.5 mm as taught by Ohno, for the purposes of increasing the strength of the honeycomb die as taught by Suzuki, and for producing a honeycomb

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structure with rounded peripheral corners, such that the resultant honeycomb structure produced by the die, can withstand stresses and avoid being chipped or cracked.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshimasa, et al. in view of Masaaki, et al. (JP 2000-326318). Yoshimasa, et al. teach the characteristics previously described but do not teach that the die is made of hard metal having high abrasion resistance formed by compacting and sintering.

In a method to manufacture a die for a honeycomb structure, Masaaki, et al. teach a process whereby the die is formed from cemented carbide sintered with the addition of metals, being of iron, cobalt and nickel added 3 to 30 %, at least (paragraphs 0035 – 0037; page 5 of 11). This manufacturing process and selection of materials ensures a junction strength (where two or three metal surfaces are joined to make the die) and toughness (paragraphs 0009, 0038; pages 2 and 5 of 11). This reads on the Applicant's claims that the die is made of a hard metal and wherein the hard metal is formed by compacting, followed by sintering at high temperature, a hard metal carbide compound powder of transition metal element series with an iron group metal binder having tenacity.

It would have been obvious at the time of the Applicant's invention to manufacture the die structure of Yoshimasa, et al. from a hard metal followed by sintering and the addition of iron, cobalt or nickel for the purpose of ensuring that the die structure has adequate junction strength and toughness as taught by Masaaki, et al.

Response to Arguments

16. Applicant's arguments with respect to claims 7 – 10 and 12 have been considered but are moot in view of the new ground(s) of rejection. Applicant argued that Fukuda, et al. did not show a die structure with an even number of cell blocks on the front face, wherein the back holes are disposed at every other position of the cell blocks. Examiner agrees and thus, has cited the reference of Yoshimasa, et al. Yoshimasa, et al. teach a die structure such that the front face has an even number of cell blocks per one side, the cell blocks forming groovy slits on a front face thereof, and wherein the back holes communicating with each slit are disposed at every other cell block position (figures 1 and 3). Furthermore, Examiner has cited the reference of Suzuki and Ohno to show that the die structure of Yoshimasa, et al. can be configured to have curved portions in the peripheral corners, which allows the die structure to be stronger as taught by Suzuki, and to have rounded peripheral corners in the range of 0.5 – 1.5 mm, as taught by Ohno, for the purpose of producing an extruded body that can withstand stresses and avoid chips and cracks.

To address claims 9 – 10, Examiner has again cited the reference of Masaki. Cemented carbide (formed of a metal and carbon) not only has high wear resistance, but is also abrasion resistant or is resistant to being worn – which is synonymous with wear resistance and thus, the reference of Masaki teaches the limitations in both claims 9 and 10 as amended.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maria Veronica D. Ewald whose telephone number is 571-272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


JOSEPH S. DEL SOLE
PRIMARY EXAMINER
5/22/06

MVE